

HAS HE HARNESSSED THE SUN'S RAYS?

Letters Patent Have Been Granted to Doctor William Calver of Washington, D. C., on an Invention Which May Revolutionize Existing Systems of Obtaining Power.

Sun Heat
and Force Con-
centrated
for Practical Use.

Special Correspondence of The Sunday Republic.

The human mind grasps great things slowly. Philosophers have ever worked at problems which appear utterly vain to the great mass of people. Man has been prone to doubt as are the sparks to fly sparks. Galileo was imprisoned for his invention of the telescope. Columbus at first was treated for a fool and at last died in chains because of his idea that the world was round instead of flat. Morse peddled his electric needle until he was forgotten and almost at the point of giving up his invention, and men laughed to scorn his wild notions of a magnetic telegraph. People said that that had only discovered a pretty plaything for children, when the young inventor was almost heartbroken by the struggle for the recognition of the possibilities which he alone saw in the telephone.

Within the past two weeks a man of science, Doctor William Calver, who has been working for twenty odd years on the vastest material problem which has ever presented itself to mankind for solution, has been granted letters patent simultaneously in the United States, England, Germany and France on an invention which contains within itself possibilities of a revolution as radical as that of a reorganization of society as great as those which followed the first

practical introduction of steam power. As a matter of fact, the invention of the power of magnetism followed the same course to outgrow the invention and its bearings on society with all the far-reaching consequences of its universal introduction. And yet man has been working at the problem, which Doctor Calver claims to have completely solved, for thousands of years. Scientists of every generation, since the time when it was first propounded by Archimedes, have studied and striven for its accomplishment.

As is well known to every schoolboy, the source of all power is the heat and light of the sun. To collect this and to chain it directly to the machinery which makes the evidence of this period possible, and to make it serve mankind by night and by day, to do for him his duty as practically as coal, to make it flow like water and draw his water, run his railways, furnish light and heat to cities, to propel his vessels, and to save him in short, to substitute it everywhere for the present use of coal and wood and other fuels, has been the dream of Lullius of Herculaneum and Erasmus, Professor Landy of the Smithsonian Institution has written, in powerful words, calling attention to the necessity for such an invention. He has declared that the human race must depend in the future upon

the sun for heat and power. It is a method for the utilization of the heat of the sun in a practical way and for a small final cost than Doctor William Calver claims to have discovered. In substantiation of his claims he shows machinery and results which would seemingly convince the most skeptical.

The correspondent of your paper called on Doctor Calver at his home in Washington. The Doctor is a man of something past middle age. His hair and beard are streaked plentifully with gray. Physically he is of medium stature, but his frame is almost massive in its proportions. In manner the doctor is genial, kindly and very gentle. Like many inventors he seems thoroughly wrapped up in the work that he has accomplished and the work that he has in view.

"I believe, in fact I know," said he in answer to a question, "that I have solved the problem of the direct conversion of the sun's rays into a heat which can be utilized on a far cheaper commercial basis than coal. I have also devised a method for the storage of this heat so that it can be used at any desired time and place. I feel that beyond a doubt I have settled forever the question of the actual commercial harnessing of the direct rays of the sun and of their conversion to the use of man."

"The process which I have invented is a distinct departure from anything which has ever before been attempted by men working in my line. My methods are the essence of simplicity. No complicated and costly machinery is used in a single portion of the invention. Once my machine is built it will last practically indefinitely, and as long as the sun continues to give heat and light to man it will labor in his behalf."

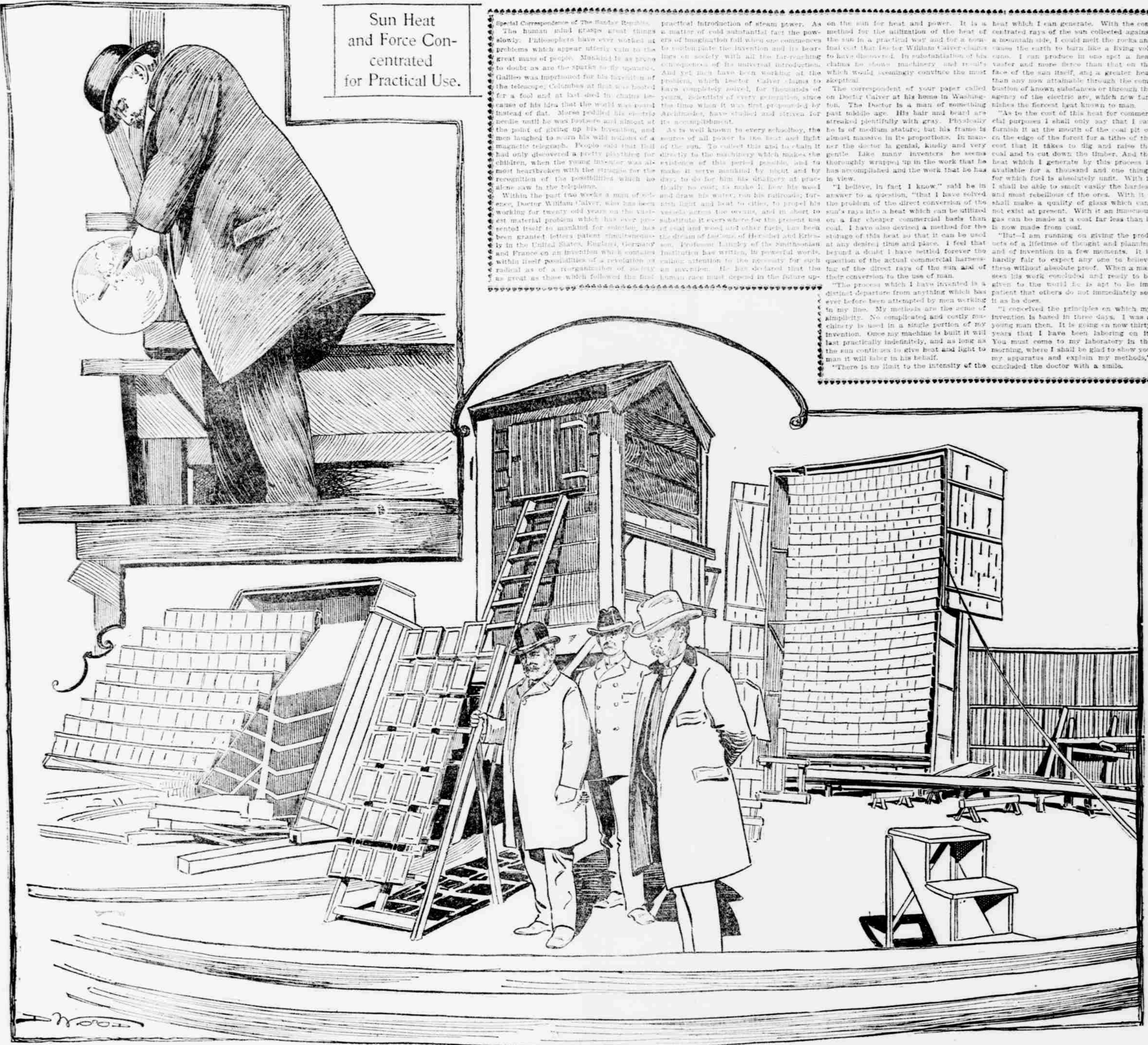
"There is no limit to the intensity of the

heat which I can generate. With the concentrated rays of the sun collected against a noncombustible, I could melt the rocks and cause the earth to burn like a living volcano. I can produce in one spot a heat vaster and more fierce than that on the face of the sun itself, and a greater heat than any now attainable through the combustion of known substances or through the agency of the electric arc, which now furnishes the fiercest heat known to man."

"As to the cost of this heat for commercial purposes I shall only say that I can furnish it at the mouth of the coal pit or on the edge of the forest for a tithe of the cost that it takes to dig and raise the coal and to cut down the timber. And the heat which I generate by this process is available for a thousand and one things for which fuel is absolutely unfit. With it I shall be able to smelt easily the hardest and most rebellious of the ores. With it I shall make a quality of glass which cannot exist at present. With it an immense gas can be made at a cost far less than it is now made from coal."

"But I am running on giving the products of a lifetime of thought and planning and of invention in a few moments. It is hardly fair to expect any one to believe these without absolute proof. When a man sees his work completed and ready to be given to the world he is apt to be impatient that others do not immediately see it as he does."

"I conceived the principles on which my invention is based in three days. I was a young man then. It is going on now thirty years that I have been laboring on it. You must come to my laboratory in the morning, where I shall be glad to show you my apparatus and explain my methods," concluded the doctor with a smile.



IN ONE OF THESE PICTURES, WHICH ARE FROM PHOTOGRAPHS TAKEN FOR THE SUNDAY REPUBLIC, DR. CALVER IS SHOWN STANDING BY ONE OF THE EXPERIMENTAL HELIO MOTORS, OF WHICH SEVERAL ARE SHOWN IN THE GENERAL VIEW OF THE INVENTOR'S LABORATORY—THE UPPER PICTURE IS OF DR. CALVER SETTING FIRE TO FROZEN WOOD BY MEANS OF THE CONCENTRATION OF REFLECTED SUN RAYS.

The writer alighted about 9 o'clock the next morning at the end of the North Capitol street car line. Following directions he made his way up a high hill to the right and passed around behind a large mansion and found himself confronted by a board fence some ten or twelve feet in height. This included a lot about half an acre in extent.

The morning was cold and a semicircle lay over the city and partly obscured the sun, whose beams struggled over the dome of the distant capitol building and down into the inclosure in a fitful uncertain fashion. A chilling wind blew from the Maryland hills to the west, while the ground under foot was frozen.

Doctor Calver was promptly on hand with a small party of persons, who are acquainted with his secret and are interested in his scientific work. "I am afraid that we have rather an inauspicious day for our experiments," he said.

"However, I can explain some of our machinery and methods to you."

The sight which met the reporter's gaze as he entered was one at the same time both novel and interesting. At the center of the inclosure stood a small house, about twelve feet through, roughly constructed and resembling in general appearance a rough upright water tank.

This tank seemed to form the center of a system of circular wooden tracks. And

it was on these tracks that the unique feature of the exhibit was located. There were nothing more nor less than a number of mirror frames. There were in all some seven or eight of these, one to the front of the tank, two to the left and three to the right. Back of the tank was a frame, whose exposed surface would seem to equal the combined surfaces of all the other mirrors.

The construction of the mirrors with which these frames were fitted up proved, on closer examination, to be different from anything of the kind ever before heard of. In the big frame, for example, to which Doctor Calver led the way, instead of a single solid mirror or reflector, which might naturally have been expected, there were a great number of small mirrors set in a series of rows one above another. These mirrors, which were only four by six inches in size, exposed to the sun a perfectly flat surface. The method of arrangement of the rows in the frame was highly complex. It was found by a simple count that there were twenty-seven rows of thirty mirrors each in the entire frame, or 810 mirrors in all.

"It will be understood," said Doctor Calver, by way of explanation, "that the great question which confronted any one working in my field was that of arranging the reflectors of the sun's rays so that any number of them could be concentrated on the same point at the same time, and kept

there throughout the entire day. It is almost superfluous to state that all who have worked on this question agreed that if this could be done the problem was solved. An attempt has been made to do this through concentrating the rays of the sun by means of a number of concave mirrors. This has proven to be impossible over any great extent of territory and impractical from a commercial standpoint. Another experiment of my own in which I had the sunlight from a number of mirrors thrown into the large end of a great funnel and concentrated at the small end proved scarcely more successful.

"After this experiment I was forced to the conclusion that the true solution of the situation must be in the flat mirror. Working on this idea I have constructed the form of reflector, which you see before you. To this I have given the name of 'heliomotor,' the Greek, which translated means 'universal sunpower.'

"This motor consists, as will be seen, of the simplest arrangement possible. Each of the small flat mirrors is attached to a simple gearing device by which it can be moved at pleasure. Each and all of these surfaces, four by six inches in size, can be concentrated on a very small surface at any desired distance. In practice they are concentrated on the reservoir in the center of the yard. Each glass reflects from twelve to fifteen degrees of heat from the sun."

"How about the point of concentration when the sun moves around?" was asked.

"That is simple enough," said Doctor Calver. "The frame moves too. It is geared and adjusted in such a simple manner as to be moved along the circular track by even the most ignorant of attendants. One man could keep a great number of these machines focused on a single point. All that is required is the occasional adjustment of some pulleys."

"Now as to the exact value of the frame before us. I have estimated that each mirror, four by six inches, reflects a heat equal in the course of a year to that generated by the combustion of a hundred pounds of the best anthracite coal. Therefore the frame before us is about equal each year in heat-giving power to forty tons of the best coal. This is more than the actual cost at which the frame could be constructed. It must be remembered that this frame is only an experimental one, having a reflecting surface of only about 120 feet. This is what has been done in the present instance and in practical work on an extended scale this same principle will be applied, only to a much greater extent and on a much larger scale than in the small experimental reservoir here."

"At the same time it may be stated, as a matter of interest, that I have kept three or four hundred degrees of heat—a much higher temperature than is needed to make steam—in this reservoir for a week at a time."

"From the 1,200 mirrors in the laboratory here, which can all be concentrated on a single point, I have generated on the cold

days sufficient heat to weld copper and Russian iron. I have burned a brick half way through in half an hour. I have concentrated the combined heat from the mirrors on an ordinary unburned brick and have burned it so hard that it scratched steel."

Doctor Calver described a number of experiments which demonstrated the efficacy of his methods and the terrific amount of heat, nearly ten thousand degrees, which he can concentrate in a single spot. He then showed the party some of the brick which he had burned, as well as the metals which he had melted and welded. Some of the simpler of these experiments he performed.

The rays from a couple of the smaller helio motors were concentrated on a corner of the reservoir. Some one walked near and held a handkerchief for a moment at the point of concentration. A white light of dazzling brilliancy was reflected, causing everyone around to close his eyes.

Doctor Calver reached down and picked a stick from the frozen soil. He mounted the reservoir and holding the stick in one hand he focused, by means of a small hand reflector, the heat of the combined mirrors on a portion of the frozen wood. In a moment it cracked, smoked and burst into a fierce flame.

Sixteen feet in front of a small helio motor, whose reflecting surface was but ten square feet, he placed a tin boiler full

of water. A few minutes after he had concentrated the mirrors on its surface the water was boiling merrily.

"Why, that little trick could cook a dinner for a whole family in summer time," remarked a member of the party.

"And the cost of cooking for the whole year would average about a cent a day," said the doctor.

Doctor Calver has interested a number of gentlemen with him and will endeavor to utilize his discovery in all of its practical possibilities; this includes the furnishing of power and heat, smelting and the making of artificial gas. The discovery will also be exploited in furnishing power for pumping in irrigating the arid lands of the great West, where fuel is scarce and expensive and sunlight is plentiful.

When asked what he believed the effect of his invention would be on humanity, Doctor Calver said:

"I had few better friends than the late Senator Leland Stanford, who knew my invention well and sympathized with my purpose and ends. Conceiving with me one day said of my helio motor: 'If perfected, it will do more for humanity than all we have at present. The steam engine made a great revolution and this will make another and a greater.'"

"I have nothing to add to what my friend has said except that my invention is completed now," said Doctor Calver.

JAMES M. THOMSON.

ROMANCE OF AN EXPRESS PACKAGE.

WRITTEN FOR THE SUNDAY REPUBLIC.

Down in the basement of the building occupied by the Pacific Express Company, at St. Charles and Fourth streets, is a lot of old plunder, that is sold off every now and then to make room for more that is coming. And about one of the old bundles that lay there for six months or so and was sold for \$2.75, there hangs a tale.

It was some ten years ago that this

bundle was on hand as unclaimed. It was a very ordinary bundle—simply a roll of old bed clothing. It came in on an early train one morning in June, 1891, addressed to Thomas Johnson. No street number was given, and the bundle was held for a caller. It was sent from some point near St. Charles, Mo.

Two or three days after the bundle arrived a man who looked like a farmer who

had come to town and rigged himself out in a suit of store clothes applying at the office of the express company and asked for the bundle. He described it and stated that he was moving here from out in the State, and sent the bedclothing by express so it would get here in time for use before the rest of the furniture got here by freight.

W. J. Lane, who was then one of the clerks in the office, but who is now in charge of the city money order business of the company, was the clerk of whom the inquiry was made. He questioned the fellow closely, not that he suspected anything, but because it is a habit of express clerks to ask questions. Then he went

back into the freightroom for the bundle.

It took him a long time to locate it. It had become buried under a lot of other plunder, and was hard to get at. Finally, with the assistance of a porter, he lugged the thing out and prepared to deliver it.

But the man was gone. Lane did not know why, unless he had got tired of waiting, and he put the bundle aside. This time he put it in a place where it could be got at easily when Mr. Johnson should call for it again and take it away. Lane did not want it. He was boarding, and had all the bedclothing he wanted. And, besides, it was June, anyhow.

But Mr. Johnson never returned. Lane insisted on keeping the bundle in easy reach

until the "boss" told him he either had to move it or get another job. Then the bundle went into the basement.

Lane made a mental bet with himself that he would have to lug the thing back again within twenty-four hours.

But six months or so passed, and finally Lane decided that he had lost the bet and paid it. In the course of some five or six months the bundle was sold along with a lot of other unclaimed stuff. A negro was the purchaser after some spirited bidding, which ran the price up from 40 cents to \$3.75.

Next day the negro came back to the express office.

"Boss, I didn't 'spec to tell anybody; but

them wasn't bed clothes what I bought 'tater day."

"What was it, then?" was the most natural question that Lane could think of.

"It was a whole lot of silver stuff in wild B." replied the negro.

"What did you do with it?" asked Lane, who was interested, but didn't show it.

"Got it at home," said the negro.

"Why didn't you sell it?" Lane asked. That was not a natural question, but Lane was thinking of something to do in the matter.

"Well, boss, I tell you. It was dis way. You see, I knowed a mistake had been made, and dat somebody had 'log' what I found. An' s'ides dat," he added, "I was afraid to try to sell it, 'cause I didn't know

but what de police might git a-holt of me."

Upon investigation, as the police report said afterward, it was discovered that the silverware had been stolen from a residence in St. Charles, Mo., by burglars, and that a diligent search had been made by the police officers of that town and county, but without result. It was believed by the St. Louis police that the burglar had packed the goods up and shipped them to St. Louis by express, consigning them to a fictitious person whom he represented.

A representative of the St. Charles family came to St. Louis, saw the negro, identified the silverware and paid a handsome reward for its recovery. He could afford to do it, for the valuables were worth in the neighborhood of \$500.